ORIGINAL

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

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Federal Communications Commission
Office of the Secretary

In the Matter of	)	
	)	ET Docket No. 92-9
Redevelopment of Spectrum	)	
to Encourage Innovation in the	)	
Use of New Telecommunications	)	
Technologies	)	

To: The Commission

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FILE

REPLY COMMENTS OF
THE AMERICAN PETROLEUM INSTITUTE

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SUMMARY

The extensive record developed in this proceeding supports API's assertion that the Commission's choice of spectrum for a new technology reserve is ill founded. Indeed, numerous commenters joined API in questioning the adequacy of the Commission's "staff study" as a basis upon which to move forward with one of the largest reallocation proceedings in Commission history.

The record demonstrates that several parties share API's concern that the Commission has not performed adequate analysis of demand for new technologies, or determined what precise new technologies may be accommodated by the proposed spectrum reserve. Further, numerous commenters agree that services essential to the public welfare are provided via systems using the frequency bands at issue in this proceeding, and that should the Commission proceed with the proposed reallocation many of those systems will be displaced.

Accordingly, API reasserts that the Commission must act to protect the vital services provided by incumbent 2 GHz spectrum licensees. After definition of the actual new services proposed, the Commission must engage in further

study to determine demand for those services. Further, should the Commission determine that a new technology spectrum reserve is imperative, the Commission must fully consider all possible spectrum alternatives which may provide the optimum propagation techniques for proposed new services while providing minimal disruption of essential services.

Moreover, should the Commission propose that "spectrum sharing" techniques be used to allow new technology interests into the targeted spectrum, further study and development of spectrum overlay techniques must be pursued before spectrum sharing can be considered feasible. Further, the Agency's transition proposal must be modified in order to provide adequate protection to the critical services now provided by incumbent licensees. The Commission must also realize that higher range spectrum and alternative technologies even in combination, cannot provide adequately reliable replacement service for 2 GHz spectrum in all cases.

Finally, several commenters agree with API that the proposed reallocation is unnecessary on the ground of international equipment interoperability, and agree that the Commission has failed to meet its public interest mandate to

afford safety-oriented uses the highest allocation priority. The Commission must review its present proceeding and develop better spectrum alternatives than those now proposed.

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Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies	)	

To: The Commission

REPLY COMMENTS OF THE AMERICAN PETROLEUM INSTITUTE

The American Petroleum Institute ("API"), by its attorneys, pursuant to the invitation extended by the Federal Communications Commission ("Commission" or "FCC" or "Agency") in its Notice of Proposed Rule Making ("Notice")[1/] in the above-referenced proceeding, respectfully submits the following Reply Comments for consideration by the Commission.

I. BACKGROUND

1. API filed Comments in this proceeding explaining that API supports new communications technologies, but urging the Commission not to displace more than 29,000

1/ Notice of Proposed Rule Making, 7 FCC Rcd. 1542 (1992).

licensees in the 1.85-1.99 GHz, 2.13-2.15 GHz and 2.16-2.20 GHz bands ("the 2 GHz band") for as yet an undefined group of "new technologies" without adequately examining less drastic alternatives. API asked the Commission to consider the critical public health and safety benefits that 2 GHz systems in the Private Operational-Fixed Microwave Service (POFS) now occupying these bands provide.

2. Numerous other parties, including governmental agencies, document that essential services are provided via systems using the frequency bands at issue in this proceeding. Moreover, a significant number of parties agree with API that the present attempt to authorize new technologies in the subject bands will result in displacement of critical services to the detriment of the public welfare. Consequently, API remains convinced that the Commission's proposal is contrary to the public interest and that to proceed hastily in the manner proposed is an abrogation of the Commission's statutory responsibilities to make spectrum allocations decisions based on rational analysis of what will best serve the "public interest, convenience and necessity", and which will ensure "public safety-oriented" uses the highest allocation priority.

II. REPLY COMMENTS

3. Following a detailed review of the Comments submitted in this proceeding, API finds that there is little in the way of a solid consensus supporting the new technology proposal. Certainly, there is no clear demonstration that there is a market demand for the proposed new technologies sufficient to outweigh the value of the critical operations now performed in the target spectrum. Moreover, there are no compelling demonstrations by supporters of the reallocation proposal that the purported new technology services will be significantly different than services already offered in current spectrum allocations.

4. API supports Commission efforts to bring, where feasible, new technologies to the public. However, API reminds the Commission that no matter how appealing a proposed service may appear, the Agency bears an unavoidable obligation to render spectrum allocation decisions on a basis consistent with the public interest. In performing this responsibility, it is not enough for the Commission to simply acknowledge potential demand or possible public appeal of a given service, and to make a grand scale spectrum reallocation decision on the basis of perfunctory internal staff "analysis". Rather, the Commission must

provide a detailed and reasoned analysis which takes into account all reasonable alternatives, the potential costs to the public health and safety, the dollar cost of replacement of services critical to the public, and the potential impact of the reallocation on uninterrupted provision of critical communications services. API notes that numerous commenters in this proceeding agree that the Commission's present proposal is not sufficiently well-reasoned to present an adequate basis upon which to premise one of the largest spectrum reallocation in the Agency's history.

A. The Commission Must Act to Protect the Vital Services Provided by Incumbent 2 GHz Spectrum Licensees

5. As the Comments abundantly demonstrate, the channels in the targeted spectrum are now employed to support and/or ensure the safety of a multiplicity of vital tasks including, but not limited to, oil and gas exploration/production, pipeline transportation of petroleum products and natural gas, electric power transmission and distribution, railroad transportation, public safety communications, and scientific research. These frequencies also serve as backbone communication links for cellular

telephone systems.[2/] Current 2 GHz fixed licensees fulfill highly critical needs of modern American society and the Commission must weigh more seriously the public interest benefits provided by private operational-fixed microwave systems now licensed in the spectrum targeted for reallocation. The Commission cannot ignore the clear record evidence that many basic necessities of modern life are made possible through operations now conducted in the target spectrum.

6. Since it has been abundantly demonstrated that the services now performed in 2 GHz spectrum are critical to the well being of the public, the Commission must demonstrate in any reallocation proceeding that such critical communications activities may continue unimpeded because the

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2/ See generally, Comments of Utilities Telecommunications Council (UTC); Association of American Railroads (AAR); Montana Power Company (MPC); Central Maine Power Company (CMPC); Atlantic Electric Company (AEC); National Rural Electric Cooperative Association (NRECA); Eron Pipeline Company (EPC); Texas Gas Transmission Company (TGTC); American Gas Association (AGA); Interstate Natural Gas Association of America (INGAA); Coastal Corporation (Coastal); Large Public Power Council (LPPC); American Public Power Association (APPA); All TeL Corporation (ALLTel); Bluegrass Cellular (BC); Telephone and Data System (TDS); Cellwave, Inc. (CI); and Cellular Telecommunications Industry Association (CTIA).

Commission has a statutory[3/] as well as a court-imposed duty[4/] to provide critical safety-oriented spectrum uses the highest allocation priority. This is particularly true in the present proceeding where the proposed reallocation would only accommodate services which are "primarily in the nature of a convenience or a luxury".[5/]

7. The record demonstrates that the Commission has options available by which it may accommodate new technology interests without creating the unwarranted disruption of current POFS operations in the 2 GHz bands.[6/] API and numerous other commenters have explained the pressing need of incumbent licensees for the proven, highly reliable telecommunications capabilities offered by 2 GHz spectrum, and have requested that the Commission explore "new technology" spectrum alternatives other than that proposed.[7/] API reiterates that it is imperative that the

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3/ 47 U.S.C.A. § 151.

4/ National Association of Broadcasters v. FCC, 740 F.2d 1190, 1214 (1984).

5/ Id.

6/ See generally, Section "F", infra.

7/ See, e.g., Comments of UTC, AAR, LPPC, NRECA, EL Paso Natural Gas, AGA, Coastal and ALLTel.

Commission make every effort to ensure that there is no disruption of critical 2 GHz operational-fixed radio systems.

8. Other Commenters supported API's view that the Commission's entire approach to this proceeding was a disturbingly familiar abdication of any responsibility to give priority to uses of the spectrum which promote public safety. In fact, the Commission's OET Report goes out of its way to find reasons why alternative bands, which do not have any public safety application but serve only entertainment or informational purposes, could not be made available for the new spectrum reserve.[8/] For example, the OET Report did not even seriously consider the 2.50-2.69 GHz ("2.5 GHz") band, although that spectrum is lightly used and serves no public safety purpose. Likewise according to OET, the Broadcast Auxiliary Band within the 2 GHz range could not be touched because it is allegedly heavily used, whereas the equally heavily used POFS portion of the band could be reallocated. Despite the clear directive of Section 151 of the Communications Act and concern of the courts in similar cases,[9/] the Commission appears to give no priority

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8/ See Comments of UTC at 16-31.

9/ See National Association of Broadcasters v. FCC, 740 F.2d 1190, 1214 (1984).

whatsoever to public safety use of the spectrum by POFS licensees.

9. Moreover, API disagrees with the Commission's decision to provide indefinite grandfathering for "governmental public safety" incumbent licensees, while refusing to provide the same protection to systems licensed to private entities who also use this spectrum for critical public safety functions. The simple labeling of a public safety-oriented communication facility as "government vs. non-government" makes no sense when both types of licensees have communication roles critical to the public safety as well as the environment. Neither Section 151 of the Communications Act nor its legislative history make a distinction between government or private telecommunications operations which promote the safety of life and property.10/ Accordingly, API submits that the public safety-related uses made of 2 GHz spectrum by private industrial operators such as petroleum and natural gas pipeline companies are of equal safety importance as those of governmental public safety licensees. The Commission must, therefore, provide the same spectrum protection to public safety-oriented private spectrum licensees which it provides to governmental public

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10/ 47 U.S.C.A. § 151 (1990).

safety licensees since there is no distinction in the public necessity for the service they provide.11/

10. Several commenters echo API's concern with the inflated claims of "spectrum sharing" proponents. While new technology proponents continue to tout the efficacy of various spectrum sharing techniques, exhaustive field tests of such techniques belie such claims. The most in-depth joint evaluation of spread spectrum technology indicates that "spectrum sharing" will not provide sufficient protection to the critical operations of incumbent licensees to allow "shared" operation of incumbent OFS stations and certain new technologies.12/ Other technologies, while perhaps promising, have not been tested thoroughly enough to

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11/ Private microwave assignments in the 2 GHz range serve the petroleum and petroleum pipeline industries in numerous ways providing, among other things, remote monitoring and control of petroleum production sites, communications between refineries and within refinery sites, and remote monitoring and control capabilities for the nation's petroleum and natural gas pipeline system. These telecommunications systems must provide absolute reliability, redundancy and a high degree of safety to the public. See, API Comments in FCC Gen. Docket 90-314 (1990).

12/ See Report on Results Compatibility Test of PCN American Spread Spectrum Microwave System with Point-to-Point Microwave System, Houston Area Microwave User's Group (HAMUG) (July 23, 1991);

ensure that harmful interference will not occur.[13/] Accordingly, since it is clear that disruption to vital systems will occur in a "sharing scenario", the Commission must not act hastily to allocate the target spectrum to new technologies on a co-primary basis with incumbents. Rather, as discussed below, the Commission must fully explore all possible spectrum choices for new technology provision. API and others are convinced that spectrum other than that now proposed will adequately meet any need which may emerge for the proposed new technologies.[14/] Alternatively, should the Commission determine after a more careful analysis that there is no alternative to the proposed reallocation, the Commission must act in a manner which will ensure the least possible disruption to incumbent operations. Such an effort must include significantly more testing; and in all likelihood, further technical improvement of spectrum

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13/ See Comments and Reply Comments of API in Response to American Personal Communications "FAST" Report; Comments of AT&T, FCC Gen. Docket No. 90-314, 7-10, (1990).

14/ See, e.g., Comments of APPC; UTC; AEC; Questar Corporation. API and others have suggested that the underutilized federal government band 1710-1850 MHz could present an appropriate spectrum home for new technologies. See Motion to Suspend of AAR, LPPC and API, FCC ET Docket No. 92-9, (April 10, 1991).

overlay techniques before the Commission can contemplate any routine "shared" operations in the target spectrum.

B. Should the Commission Establish a New Technology Spectrum Reserve in the 2 GHz Bands, the Agency's Transition Proposal Must be Modified to Protect Incumbent Licensees

11. Based on the Comments of several parties, it is obvious that the Commission's reallocation proposal is likely to cause hazardous service disruptions and trigger exorbitant transaction costs.[15/] Nonetheless, should the Commission be determined to locate a new technology reserve in the proposed spectrum, it must provide a transition plan which will minimize the negative impact of reallocation. API believes that, should the Commission proceed to allow new technologies access to the target spectrum, licensing the new technologies on a non-interference basis is the only means by which the continued satisfactory operation of fixed 2 GHz links may be ensured. This transition plan at a minimum, must include indefinite co-primary status for all existing 2 GHz fixed operations as well as for expansion and modification of existing systems, since many current links cannot be replaced by higher-range spectrum choices or alternative technologies such as fiber optic and

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15/ See, e.g., Comments of UTC; MPC; AEC; NRECA.

satellite.16/ Further, the Commission must establish clear protection criteria which will ensure that mobile operations within the band will not create harmful interference to fixed operations. Additionally, the Commission must require co-primary new technology users to abate any interference created to existing fixed users, and to absorb any and all costs incurred in the remediation of interference problems.17/

12. Implementation of co-primary status between different radio services necessarily presumes that there is a standard available to determine when harmful interference is being cause to affected systems. API believes that existing microwave systems must be protected in accordance with the interference criteria set forth in EIA Bulletin 10-E. API recognizes that the EIA 10-E standard specifically addresses interference levels between neighboring fixed systems. However, the engineering principle upon which the EIA 10-E standard is premised could apply equally to situations involving mobile-to-fixed

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16/ See generally, Comments of UTC; TGTC; AAR and LPPC.

17/ Ample justification and precedent for such a "first in time, first in right" co-primary operational policy exists. See, Report and Order, FCC Gen. Docket No. 80-603, para. 67, 90 F.C.C. 2d 676, 702. (1982) ("DBS Allocation Order").

interference, as in the case of PCN handheld units causing interference to fixed microwave systems. API urges the Commission, therefore, to mandate the EIA 10-E criteria as the appropriate standard for assessing interference from PCN systems to fixed stations.

13. Only by ensuring that operational-fixed systems may continue to have access to 2 GHz spectrum where necessary, can the Commission ensure that the public interest in the continued provision of the services now conducted in these bands will be served. Moreover, the record clearly demonstrates that many of the present uses of the targeted 2 GHz spectrum are mandated in the public interest by federal agencies having jurisdiction over essential but potentially hazardous activities. The communications redundancy and real-time monitoring capabilities provided by this spectrum demonstrate that the 2 GHz band is in many instances, uniquely capable of providing the level of reliability demanded by federal regulators.18/

18/ See Comments of United States Department of Energy (DOE) and Comments of TGTC. See also, Letter of George Tenley, Associate Administrator of Pipeline Safety, U.S. Department of Transportation to Ralph Haller, Chief, Private Radio Bureau, Federal Communications Commission, concerning private microwave systems (1990).

C. The Commission's Conclusion that 2 GHz Spectrum Provides an Optimal Home for New Technologies is Erroneous

14. Many Commenters in this proceeding agree that 2 GHz spectrum is not necessarily the perfect home for a new technologies reserve, and that for many of the proposed new services -- particularly PCS and data PCS, other spectrum may provide more desireable operational characteristics. The Commission is well aware that experiments by private industry are underway with the objective of providing mobile operations in spectrum above 3 GHz.19/ This is particularly noteworthy since it is known that higher-range spectrum will provide more efficient frequency re-use capability and better operating potential for "mini-cellular" configured operations such as PCS and data-PCS.20/ Moreover, higher range spectrum will adequately meet the needs of the other

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19/ See "Brooklyn Co. Looks to 28 GHz for PCS Use", Multichannel News, June 15, 1992, pp. 12, 13. This article outlines recent experiments in PCS operations at 28 GHz which, due to the excellent "re-use" characteristics of 28 GHz range frequencies, have been termed very successful. API notes also that Motorola has successfully used 18 GHz spectrum to provide "data-PCS" service. API also notes that AT&T is developing a PCS system for operation at 6 GHz. See: Statement of Dale Stone, Director, Personal Communication Networks - AT&T, before the FCC en banc PCS Hearings (December 5, 1991).

20/ See Multichannel News, Id., pp. 12, 13.

"new technology" services to which the Commission alludes in the NPRM.

15. API reasserts that frequencies below 1 GHz also hold significant promise for use by emerging technologies. Particularly, for PCS and data-PCS operating on low power in urban environments, frequencies below 1 GHz provide significantly more desirable propagation characteristics since they penetrate buildings, trees, leaded glass and other obstructions more efficiently than do frequencies in the targeted spectrum. Further, the PCS-type operations for which the Commission apparently plans to dedicate most of the new technology reserve spectrum will likely be offered in the near future by cellular interests now operating in the 800 MHz range. It is possible that PCS services could be made available through cellular operations by a minimal expansion of the current cellular allocation. Such an approval would create little, if any, displacement of essential services, and would allow spectrum with better urban penetration and propagation characteristics to be made available to provide PCS to the public.

16. The Commission's faith in 2 GHz spectrum as absolutely optimal for new technologies is misplaced particularly since "new technologies" are yet to be defined.

API questions how a particular spectrum location can be described as exhibiting "ideal propagation characteristics" when the actual uses of the spectrum are unknown. The Commission's belief clearly is based on an inadequate analysis. The Commission must review other spectrum choices, and make an effort to locate spectrum for a new technology reserve in frequency ranges which will provide optimum operational characteristics for particular services after those services are defined. Furthermore, the record clearly demonstrates that spectrum choices within the 1-3 GHz range other than those now targeted are available which may allow new technology deployment without triggering the potentially hazardous service disruptions and exorbitant transactional costs which the Commission's current proposal will bring about.21/

D. The Commission's Choice of Replacement Spectrum For Existing Users is Inadequate

17. As currently written, the NPRM fails to specifically address under what technical parameters displaced 2 GHz users can operate POFS systems at higher bands. Footnote 16 of the NPRM delineates the frequencies available as replacement spectrum for potentially displaced

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21/ See Section "F" infra.

2 GHz users. However, the Commission never considered whether these frequency bands can adequately accommodate existing 2 GHz users in either the NPRM or its OET Study. An overwhelming number of commenters suggest that before any relocation of 2 GHz users to higher bands can occur, the Commission must fully consider the technical and operational characteristics of the higher bands.22/ This includes evaluating whether existing 2 GHz POFS systems can reliably operate in higher bands, and promulgating rules concerning interference, channel loading and band re-channelization.

1. Bands above 3 GHz are Technically Inadequate for some Operations

18. Perhaps Alltel Corporation, the National Rural Electric Cooperative Association (NRECA) and McCaw Cellular Communications describe it best when they pointed out that a move to higher frequencies or alternative technologies will present operational problems for many current 2 GHz systems such as increased fading and signal outages, to say nothing

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22/ See generally, Comments of Tel/Logic, Alcatel Network Systems, Inc. (Alcatel), UTC, AGA, INGAA, AAR, LPPC, National Telecommunications and Information Administration (NTIA), Telephone and Data Systems, Inc., Bellsouth and GTE Service Corporation (GRE). See also, footnote 32 infra.

of the enormous costs involved.[23/] API agrees that the Commission must examine these concerns carefully before concluding that all needs currently met by systems operating in the 2 GHz band can be accommodated on frequencies above 3 GHz. API believes that the Commission underestimates the difficulty of relocating existing paths to higher bands. At a minimum, additional hops will be required, which increases noise levels, degrades reliability and creates problems in acquiring additional tower sites.

19. Two of the frequency bands in which the Commission proposes to relocate existing 2 GHz licensees are the 4 and 6 GHz bands. Both Motorola and Comsearch place undue reliance and significance on the Comsearch study indicating that all 2 GHz licensees in the Houston area can be relocated to the 6 GHz band.[24/] While this study indicates on paper that it is technically feasible to relocate all 2 GHz licensees, the actual task of designing, engineering and operating highly reliable microwave systems in both the 4 and 6 GHz range may present unsolvable practical problems.

23/ See Comments of ALLtel at 2-4, NRECA at 6 and McCaw Cellular Communications (McCaw) at 17.

24/ See Comments of Motorola at 13-15 and Comsearch at 3-5 and Appendix B.

First, to design and engineer microwave systems for operation at 6 GHz is already extremely difficult due to the congestion in those bands. The Commission's own congested area listing indicates that new microwave systems cannot be engineered-in without use of special equipment.25/ Likewise, the 4 GHz band is used primarily for satellite transmit/receive and receive-only earth stations. Undoubtedly there will be similar congestion and interference problems in this frequency band.

20. Second, relocation of 2 GHz microwave systems to these bands also reduces the performance and reliability of the operations. A 1990 Chevron study indicates that in certain areas such as the Gulf of Mexico, the relocation of current microwave operations to higher bands, will create a considerable loss of reliability.26/ A major factor not considered by the Comsearch study is that many petroleum operations occur in the Gulf of Mexico. In this regard, API agrees with Montana Power Company and McCaw Cellular

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25/ Private Microwave Congested Areas, Public Notice, released June 22, 1983 is attached as Appendix A. Since 1983, these bands have become more congested. This listing also raises obvious questions about CYLINKS' claim that there is vacant spectrum in the 1.8-2.2 GHz band in the San Francisco area. See Comments of CYLINK at 3.

26/ See API Comments, Docket No. 90-314, Appendix C.

Communications that a move to higher frequencies will not accommodate all existing operations.[27]

21. Another frequency band the Commission suggests to accommodate displaced fixed operations is the 11.7-12.2 GHz band. This band is currently used in satellite operations as the downlink frequency band for Ku-band domestic satellite systems. As suggested by Hughes Network Systems, relocating displaced 2 GHz users in this band may be technically impossible because it will cause operational complications for both satellite and POFS users.[28] Also, relocating 2 GHz users to this band could stifle the growth of existing VSAT systems and cause harmful interference to microwave systems.

22. Several commenters suggest that fiber optic technology will not be a suitable substitute for 2 GHz microwave.[29] Fiber optics, as most commenters noted, is too expensive and unreliable to be a substitute for all existing 2 GHz paths. Many commenters noted that to deploy

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27/ See Comments of MPC at 4 and of McCaw Cellular Communications at 28-31.

28/ See Comments of Hughes Network Systems, Inc. at 2.

29/ See Comments of TGT at 6, Comments of LPPC at 39, Comments of AEC at 6.